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THE AMERICAN ASSOCIATION.

FIFTIETH ANNIVERSARY.

The American Association for the Advancement of Science celebrated the fiftieth anniversary of its organization by holding an unusually large and important meeting in Boston, the city of its birth. The first General Session was held on Monday, August 22, and the meetings were continued throughout the week.

In 1847, the parent association—the American Association of Geologists and Naturalists, which was organized in 1840 as the Association of American Geologists—held its annual meeting in Boston under the presidency of William B. Rogers. At this meeting it was decided to enlarge the scope of the Association by the adoption of a new constitution that should embrace all branches of science and admit all lovers of science. The present Association was, therefore, organized in Boston, although its first regular meeting was held in Philadelphia, in 1848, under the presidency of William C. Redfield. For two years the meetings of the Association were held in the South in the winter and in the North in the summer; and as they were suspended for five years, during the period of the Civil War, the fiftieth anniversary thus occurred at the forty-seventh meeting.

At the first General Session on Monday, the retiring President, Professor Wolcott Gibbs, of Harvard University, presided and called upon the Rt. Rev. William Lawrence, Bishop of the Diocese of Massachusetts, to offer the opening prayer. Addresses of welcome were made by His Excellency Roger Wolcott, Governor of Massachusetts; by His Honor Josiah Quincy, Mayor of Boston; and by Professor James M. Crafts, President of the Massachusetts Institute of Technology. Professor Wolcott Gibbs then introduced Professor F. W. Putnam of Harvard University, the President of the Boston meeting, as one who had served the Association for twenty-five years as Permanent Secretary, and who had achieved high distinction in his own special branch of science—American archæology and ethnology. Professor Putnam received a prolonged and hearty greeting from the members of the Association, among whom he has made hosts of warm friends during his long service as their executive officer. He accepted the presidency of the Association as the highest honor that could be bestowed upon him, and was especially gratified at receiving it from a founder of the Association. After replying

to the addresses of welcome President Putnam gave a brief summary of his thirty-three years' connection with the Association, and called upon all young scientists to follow his example and become members that they might receive the benefit of contact with the great minds in science. He referred to the extreme specialization in science which he considers the main cause of the decrease in the membership of the Association during the past few years, and he urged all specialists and members of special societies to join the parent society, where they could do such good work in the general advancement of science by throwing light upon the problems coming under their special research. At the close of his remarks President Putnam called upon M. Désiré Charnay, the representative of the French Government to the Jubilee Meeting of the Association. M. Charnay spoke briefly in French. President Putnam then read a message from the Russian Geological Committee of St. Petersburg extending to the American Association respectful congratulations and good wishes.

In the afternoon eight vice-presidents delivered addresses before the respective sections. Vice-President Cooley, Chairman of Section D, had been called to active service in the Navy, and sent word from Santiago, Cuba, regretting his inability to be present at the meeting.

In Section E (Geology and Geography), Professor Herman L. Fairchild, of the University of Rochester, delivered his vice-presidential address on the subject, "Glacial Geology in America." He considered this fiftieth anniversary of the Association an appropriate time for a general review of the progress of the glacial theory in America. "The life of this Association with that of its predecessor covers precisely the period since the glacial theory was introduced to American geologists. . . . The reports of the early State geological surveys, the transactions of learned societies and the volumes of Silliman's Journal, to about 1850, contain frequent reference to 'diluvial drift,' 'diluvial scratches,' 'tremendous currents of water,' and terms of similar import. The first suggestion of ice as a contributory agent in the genesis of the drift, in the form of icebergs or ice floes, was made by Peter Dobson of Connecticut in a letter to Silliman, dated November 21, 1825. The first American geologist to give a favorable reception to the glacial theory of Agassiz, as far as printed reports show, was Edward Hitchcock, in his presidential address before the Association of American Geologists and Naturalists at their second annual meeting, held in Philadelphia, April, 1841. Unfortunately for truth and for American

geology the circumstances and scientific forces of that time did not allow him to stand upon the advanced ground he had taken," and for ten years afterward no American geologist ventured openly to adopt and proclaim the theory of Agassiz. The force of theological opinion was against the glacial theory. "The hypothesis invoking water as the drift agency might be harmonized with the belief in the Noachian deluge, but the Bible gave no countenance to an ice deluge." In 1846 Louis Agassiz arrived in America; and in 1848, at the first meeting of this Association in Philadelphia, "he described the glacial phenomena about Lake Superior, showing the identity of the phenomena in America with those in Europe." The reception of the paper was not encouraging, and Agassiz did not present another paper before the Association until 1870. But from about 1850 the glacial theory began to gain ground, the younger generation of geologists being less prejudiced against the new theory. The periods in the history of drift-study in America are as follows:

"Undisputed reign of diluvial hypothesis—to 1841.

Discussion of the glacial hypothesis—1841 to 1848.

Gradual adoption of the glacial theory—1849 to 1866.

Development of glacial geology—1867 to date."

The remaining portions of the address were devoted to a study of the "Ice Body; The Glacial Period; Interpretation of Special Phenomena,—drumlins, moraines, eskers, kames, kettles, valley drift and terraces, loess, lake basins and pre-glacial drainage, glacial lakes;" and "Existing Glaciers." In closing, Professor Fairchild suggested that the glacial geologists should give up the use of the word "theory," since "it is no longer a theory but an established fact."

On Monday evening the retiring President, Wolcott Gibbs, delivered his presidential address before the Association on the subject, "Some Points in Theoretical Chemistry."

Following the plan of the Boston Meeting of 1880, the Association accepted an invitation from the Essex Institute to spend one day in Salem, and another from the Corporation of Harvard College to spend one day in Cambridge. On Wednesday, "Salem Day," no sessions of the sections were held. The members were taken by steamboat or train to Salem Willows, where they were received and welcomed by the officers of the Essex Institute and the Mayor of the city. A little after noon an old-fashioned New England fish dinner was served, and in the afternoon the members were con-

ducted by guides to the several points of interest in this old historic city. The largest party visited the Essex Institute and the Peabody Academy of Science, while others were shown the records and relics of Salem witchcraft, the haunts of Hawthorne—including the House of Seven Gables—the ancient architecture, old cemeteries and educational institutions. The party returned to Boston late in the afternoon and in the evening listened to lectures on the Metropolitan Water Supply, by Hon. Henry H. Sprague, chairman of the Metropolitan Board; and on *The Transit in Boston*, by Hon. George G. Crocker, chairman of the Transit Commission.

On Friday, "Cambridge Day," only a few of the sections held sessions in Cambridge. The various departments of Harvard were open for inspection, and officers of the various scientific institutions were present to give information. Lunch and tea were furnished by Harvard College in Memorial Hall. In the afternoon, Section H held its largest session in the lecture room of the Peabody Museum. On this occasion Mr. Frank La Flesche of the Indian Bureau, read a most important and interesting paper on "Ritual of the Sacred Pole of the Omahas." Mr. La Flesche presented a vivid picture of his own childhood as an Indian boy, and of his participation in the ceremonies connected with the Sacred Pole of the Omahas. He described his interviews in after years with the aged keeper of the Sacred Pole, and told how he finally persuaded the keeper to allow it to be transferred to the Peabody Museum, where he promised it should be kept for all time as a sacred relic of the tribe. The songs connected with the ritual of the Pole were in part sung by Mr. La Flesche and partly given on the graphophone from records which he had secured from the old Indian keeper of the Pole during his visit to the tribe this past summer.

In the evening, Dr. Charles W. Eliot, President of Harvard University, delivered an address in Sanders Theatre to the members of the Association on the subject, "The Destructive and Constructive Energies of Our Government." By request of the Council, this address will appear in full in the Volume of Proceedings of the Boston Meeting.

During the week of the meeting, 443 papers were read in the several sections, and many were of unusual importance. It will be possible, within the limits of this brief report, to notice but a few of those bearing upon some branch of geographic science, while others of equal importance will necessarily be omitted.

In Section H, Miss Alice C. Fletcher gave an illustrated paper on the "Significance of the Garment, a study of the Omaha Tribe."

This paper, like all Miss Fletcher's contributions to ethnology, gave the results of personal observation and study during her long residence among the Indians. The lantern pictures showed the different modes of adjusting the blanket as indicative of different moods and actions. The following summary will give an idea of the substance of the paper: "We have found the garment to have been an invention by which man's self-consciousness could be emphasized. Its practical uses were subservient to this primary purpose. We have noted that man's self-consciousness was born of attrition with his fellows, that his use of garments indicated not only the birth, but the development, of his conscious personality, that they expressed his relations to the unseen world, that they came to characterize his experience and exploits, to mark his place and obligations in society, and finally his freedom in personal expression."

Dr. Wolfred Nelson, a Fellow of the Royal Geographical Society, read a paper in Section I on "Cuba: its Past, Present and Future." Dr. Nelson has lived for some years in Cuba, and he spoke from personal observation. After presenting a geographical description of the island, he said that about one-half of the area remains almost a virgin forest. He referred to the native woods, including mahogany, hard cedar, ceiba and ebony, and dwelt upon the mines and minerals of the island, especially in the province of Santiago de Cuba. He spoke of the abundant crops of fruits and vegetables, and described the beauties and the dangers of the climate. In conclusion, he said, "Knowing that island as I do, I fear that an independent Cuba will be an impossibility. As an American colony she will blossom and bring forth her increase. Then, and then only, will the black plague of central and eastern Cuba cease to be a nightmare. It is a question of time. Cuba will be the brightest spot in the colonial possessions of the United States. Old conditions have passed away. This great and glorious republic must face her destiny."

An extremely interesting paper read in Section E was by Dr. Horace C. Hovey, of Newburyport, Mass., on the subject "The Region of the Causses in Southern France," illustrated with maps and stereopticon views. From his interest in the study of caves Dr. Hovey was led to join an expedition under the leadership of M. Edouard A. Martel. Les Causses is the name given to lofty table-lands in the Departments of Lot and Lozère, along the western declivity of the Cevennes Mountains, "causses" being from the Latin *calx*, meaning limestone. The Causses vary in height from 1,000 to 5,000 feet above the sea. The caverns form one of

the most remarkable features. There are several hundred, some inhabited and others used as sheepfolds. A few are quite new geologically and others are very old. The paths to them are along terraces or from the overhanging cliffs. They are almost exact counterparts of the cliff dwellings of our Southwest. From one of these caves 300 prehistoric skeletons have been taken. Another cave has nine vertical pits locally called "wells," which are from 40 to 130 feet in depth. The stalactite decoration of the caves is remarkably fine. This region has been almost wholly unknown, partly owing to the superstitious dread of the peasants; but now, under the stimulus of the Société de Spéléologie, it will soon become better known.

Professor G. Frederick Wright in Section E gave a paper on "The Age of Niagara Falls as indicated by the Erosion at the Mouth of the Gorge." The author referred to a remark of the late Dr. James Hall that "the outlet of the chasm below Niagara Falls is scarcely wider than elsewhere along its course." This he considered important evidence in support of the theory of a shorter duration of time since the glacial epoch than has generally been estimated. Professor Wright was greatly strengthened in this opinion by his investigations this summer, since he found that the disintegrating forces tending to enlarge the outlet and give it a V-shape are more rapid than has been supposed. He concludes that at the lowest estimate twelve thousand years only would be required for the enlargement of the upper part of the mouth of the gorge, a thousand feet on each side, which is largely in excess of the actual amount of enlargement. He believes the gorge cannot be much more than ten thousand years old.

Professor J. W. Spencer, of Washington, D. C., gave a paper on "Another Episode in the History of Niagara River," which was a sequel to that read before the Association four years ago upon the "Duration of Niagara Falls." The writer gave a revision of the intermediate episodes in the history, while the Falls were receding from Foster's Flats to the point of the railway bridges. He stated that after the descent of the river reached its maximum of 420 feet (by the retreat of the Ontario waters toward the north), the return to the present amount of 326 feet was interrupted by the subsequent rising of the level of the lake in the gorge to the height of 75 feet, thus reducing the descent of the river to 250 feet. This rising of the waters was occasioned by the lifting of the barrier at the outlet of Lake Ontario to an elevation 100 feet higher than the present one. By the subsequent dissection of this barrier, partly com-

posed of drift, the descent of Niagara has been increased to 326 feet.

A second paper by Professor Spencer was on the "Evidence of Recent great Elevation of New England." It contained a description of the valley terraces illustrated by actual sections, showing that the declivities of the valleys are not by even slopes, but by a succession of steps, the plains of which become terraces farther down the valley. These steps are regarded as gradation plains in the changes of the base-level of erosion, and many of the corresponding terraces are hundreds of feet above the floors of the valleys. From those features it is not inferred that the elevation need to have been from below sea-level, and consequently the gravels are not claimed to have necessarily been of marine origin.

Professor B. K. Emerson, of Amherst, Mass., read a paper on "An Outline Map of the Geology of Southern New England." The map includes Massachusetts, Connecticut and Rhode Island, and shows first, the line of Archæan out-cropping rocks, which extend along the axis of the Green Mountains from the Hoosac Tunnel to the Highlands on the Hudson, and second, the eastern Archæan granite area from Southboro to New London. The order of the successive formations, the distribution from the second area of feldspathic material toward the northeast, and the later eruptions, which furnished softened matter to blend with it, were noted; also the deposition of great beds of sandstone and shales, the folding of these and their compression into gneiss and marble, and the later processes by which the present topography was produced.

Professor Thomas Wilson, of the United States National Museum, contributed a paper to Section H on the subject, "Art in Prehistoric Times." The speaker propounded and illustrated the theory that art has been the germ of civilization, rather than one of its results. Its earliest manifestation is seen in the works of the very earliest man of which we have knowledge through his archæological remains, palæolithic man. Hundreds of his relics, in flint, bone and tusk, have been found, mostly in the caves of Southern France. Some of these show a purely decorative engraving, and in some cases the article itself is purely ornamental. In the neolithic age man's art was of a different character, and almost purely decorative, being marked and incised in pottery and bronze. As this art was evidently for the simple purpose of giving pleasure to the eye, the speaker considers that prehistoric man had in a degree the purely artistic sense.

Vice-President Fairchild presented to his section a paper on "Basins in Glacial Lake Deltas." He described a curious kettle-hole in a glacial lake delta in New York. This basin is situated in a delta which was formed by the deposition of drift and rock in a glacial lake. The delta now forms a plateau 125 feet above the village of Potter. The basin occupies about one-fourth of the area of the plateau and extends to the very base of the deposit. The only satisfactory explanation of its origin is that an isolated block of ice was left here by the receding ice front, the delta material was piled around it, and the subsequent melting of the ice block produced the cavity.

A second paper by Prof. G. Frederick Wright described "A recently discovered Cave of Celestite Crystals at Put-in-Bay, Ohio." These crystals are of a delicate blue color, hence called "celestite." They occur in many places in Europe; but the principal locality in America from which the museums have been supplied with specimens is Strontian Island, in the western end of Lake Erie. Just as this supply was becoming exhausted, a remarkable fissure was discovered last winter in Put-in-Bay Island, which is completely surrounded with very large crystals of this beautiful mineral. The fissure was penetrated in digging a well seventeen feet below the surface. It is large enough to permit the entrance of ten or twelve persons at a time. It is not an ordinary cavern, but is apparently the interior of an immense geode lined with crystals of this mineral.

In a paper entitled "Burial Customs of the Ancient Zapotecs of Southern Mexico," Mr. Marshall H. Saville, Secretary of Section of Anthropology, gave a brief account of his recent explorations under the auspices of the American Museum of Natural History. At Xoxo, five miles south of Oaxaca, he discovered a group of pyramids or "teocallis," which had evidently been used for sepulchres. To the west of the principal "teocalli" is an oval mound and on the other three sides are oblong rectangular pyramids. A most important discovery was made in a chamber in one of the mounds to the northeast of the main "teocalli." The top of this mound was overgrown with vegetation and covered with ashes and potsherds. At a short distance below the surface was a cemented floor. Several feet below this floor was a stone wall, and cemented to this wall, above the lintel of a doorway which proved to be the entrance to a tomb, were several pottery vessels. Under each of these vessels was found an idol painted red. The lintel of the door was a slab of volcanic rock, about six feet long by eighteen inches wide, which was covered with strange hieroglyphs. On entering

the chamber, the walls were found to be covered with mural paintings in several colors. The designs were mostly draped female figures in kneeling postures. In the walls of the crypt there were three niches in which were several skulls and fragments of skeletons, all painted red. The entrances to the tombs were in several cases painted red, which seems to have been the mourning color of the Zatopecans. One little arrow head was the only implement or weapon found during this exploration. From the chamber of one of the crypts a terra cotta drain pipe extended far out into the fields. The joints were several feet long and accurately fitted. At Montalban, three miles from Xoxo, are the ruins of an immense structure, built on top of a steep hill, with sunken plazas and underground passageways and great circular pillars. This was evidently the principal fortified city of the ancient Zapotecans.

At a joint session of Section H and the American Folk Lore Society, Mrs. Jeanette Robinson Murphy gave an interesting paper on the "Survival of African Music in America." The paper dealt with African folk tales and superstitions and African songs. The music, as illustrated by Mrs. Murphy from her recollections of her youth in a Southern home, was weird and strange. The folk tales were given in the quaint negro dialect.

Miss Cornelia Horsford presented to the Association the "Evidences that the Norsemen were in Massachusetts in pre-Columbian Days." "These evidences are divided into two series, one geographical, the other archæological." The geographical evidences were shown by taking the description of Vineland in Icelandic literature and applying it to the coast of North America. The archæological evidences were shown by comparing the sites of habitations uncovered in Cambridge on the banks of the Charles, "which correspond with the description of the sites of Thorfinn's and Karlsefni's houses, with work belonging to the Saga-time in Iceland." These remains were also compared with the American works most nearly resembling them in post-Columbian days, "showing that they are essentially like the ancient Icelandic work, and unlike the work of either the native or post-Columbian races on this coast."

Professor B. E. Fernow, formerly Chief of the U. S. Forestry Division, gave before Section I an account of the new "College of Forestry at Cornell University," of which he is the Director. He said that the establishment of this College of Forestry marked a greater development in the science and art of forestry than could be shown in any other direction, since this science was not known,

even by name, fifty years ago, when this Association was organized. Moreover, a memorial to Congress from this Association, twenty-five years ago, led to the establishment of the Division of Forestry in the U. S. Department of Agriculture, which was the first recognition of the science in this country. The handling of slowly maturing crops like forest trees, the speaker said, is a problem wholly unlike any other presented to the business man. The motto of the forester is not "Woodman, spare that tree," but "Woodman, cut those trees judiciously." The aim of the College of Forestry will be "to pull up the stumps of ignorance regarding forests and forestry and to educate professional foresters." The courses leading to a degree of Bachelor in the Science of Forestry occupy four years, of which the first two are devoted to the study of fundamental and supplementary sciences, including mathematics, physics, chemistry, geology, botany, entomology and political economy. The school forest will consist of 30,000 acres in the Adirondacks.

The well-known traveller, Paul Du Chaillu, an invited guest of the Association, gave the members of Section H a paper on "The Norsemen, the Conquerors of Britain." Archæological evidence was brought forward to overthrow the idea that the English-speaking people are descendants of the Anglo-Saxon race. The word Saxon might have come from the name of a weapon, called "sax," which was extensively used by the Norsemen. Proofs were given that the seafaring tribes of the Romans were Norsemen, and reference was made to the exploration of a grave on the river Cam, in England, where "everything was of Norse origin or manufacture, similar to what is found in Norseland." Among these were found Roman coins dating from the year 80 to 220 A.D., which showed plainly that "the Norse tribes were already in Great Britain during the Roman invasion of the island." The speaker regards the Anglo-Saxon race as a myth, and says we should ask the historians to show us their archæology and tell us what country they came from. He believes that we are in great part descended from the Norse race.

At the same session, M. Désiré Charnay, the delegate from Paris, in a few remarks on "The Disappearance of the Cliff Dwellers," advanced the theory that the cliff dwellers were exterminated by the warlike Indians after the latter had acquired the use of the horse, about the end of the seventeenth century. This was as yet no more than a theory, but he thought it might be found to deserve the attention of students.

As befitted the fiftieth anniversary of the Association, the Boston Meeting, according to the report of the new Permanent Secretary, Dr. L. O. Howard, was in many respects the most successful in the history of the organization. Nine hundred and ninety-three members were in attendance, Massachusetts furnishing the largest number, 231; New York the next, 158, and the District of Columbia, 96. Taken together with the members of the affiliated societies, it was the largest gathering of scientific persons ever held in the United States. Among those present there was an unusually large number of noted persons, including nine of the past presidents. There were sixteen members from British North America; an official representative from the French Republic; three guests from Great Britain; one from New South Wales; one from Brazil, and one from Japan.

The Boston Local Committee received words of praise from all sides for the perfection of its elaborate arrangements, so smoothly and successfully carried out, for the entertainment and comfort of the members and guests of the Association. The several receptions and excursions formed an exceedingly attractive feature of the meeting.

A number of interesting publications, which had been prepared especially for the occasion, were presented to the members in attendance at the Boston Meeting. These included an illustrated "Handbook to the Principal Scientific Institutions of Boston and Vicinity," with chapters on Harvard University, Massachusetts Institute of Technology, Boston University, Tufts College, Wellesley College, Boston College, The Lowell Institute, American Academy of Arts and Sciences, Boston Society of Natural History, Massachusetts Horticultural Society, Appalachian Mountain Club, Museum of Fine Arts, Blue Hill Meteorological Observatory, Boston Public Library, Boston Athenæum, Boston Medical Library, Park System, Metropolitan Water Works, Metropolitan Sewerage, Transit in Boston, Geology and Geography of the Boston District and Places of Historical Interest. Another pamphlet was an illustrated "Guide to Localities illustrating the Geology, Marine Zoölogy and Botany of the Vicinity of Boston," containing contributions from five professors and two instructors in Harvard University, Amherst College and Massachusetts Institute of Technology, on the Geology, Physiography, Marine Algæ, Petrography, Marine Invertebrates, and Palæontology of the region. A "Guide to the Peabody Museum of Harvard University" gave a brief description of the Museum, calling attention to the chief points of

interest in the several halls; and a "Guide Book to Harvard University" gave descriptions and illustrations of the principal buildings and points of interest in connection with the University.

The meeting of 1899 will be held in Columbus, Ohio, under the presidency of Professor Edward Orton, President of the Ohio State University. Professor Putnam, the retiring president, will give the presidential address at the Columbus meeting.